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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,680	03/31/2004	Taro Ikeda	071469-0308546	4353

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MCLEAN, VA 22102

EXAMINER

STOUFFER, KELLY M

ART UNIT	PAPER NUMBER
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1762

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/813,680

Applicant(s)

IKEDA ET AL.

Examiner

Kelly Stouffer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) 21-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments, filed 16 February 2007, with respect to the objection to the drawings have been fully considered and are persuasive. The objection of the drawings has been withdrawn.

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1-20 now include a negative limitation requiring the deposition of the metal layer in the necessary absence of plasma. The original specification does not convey that the applicants had possession of subject matter requiring the exclusion of plasma during the steps as it is now claimed. Any negative limitation in the claims must have a basis in the original disclosure. The

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absence of a positive recitation in the disclosure is not basis for exclusion. See *In re Johnson*, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977) and *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), *aff'd mem.* 738 F.2d 453 (Fed. Cir. 1984).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent number 5236747 to Dessaux et al. in view of US Patent Publication 2003/0019428 to Ku et al.

With regard to claim 1, Dessaux et al. discloses forming a metal layer on a substrate by pre-treating the substrate by exposing it to an excited species in a plasma (column 2 lines 41-50) from a tube that extends into, and is therefore part of the

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chamber (abstract – the examiner notes that it is also common practice in the art to use interchangeably a remote plasma generator with an in situ plasma generator depending on the equipment available), exposing the pretreated substrate to a process gas containing a metal-carbonyl precursor and forming a metal layer by a CVD process (abstract). Dessaux et al. does not include forming this layer without the presence of plasma. Ku et al. discloses using only vapor to deposit a metal layer from a carbonyl precursor to receive a film uniform in thickness (paragraphs 0005-0006), high-quality and high-yield deposition (paragraph 0024), and highly uniform and predictable deposition of the film (paragraph 0039).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Dessaux et al. to include depositing the metal without a plasma and use the vapor of Ku et al. in order to reap the benefits as such as discussed above.

With regard to claim 2, Dessaux et al. discloses the substrate as glass in column 1 lines 7-10.

Regarding claim 3, the pretreating of Dessaux et al. comprises creating plasma from nitrogen and then exposing the substrate to the plasma (column 2 lines 41-50).

Regarding claims 4 and 5, Dessaux et al. discloses a plasma having microwave or rf power of 2450 MHz and 0-1500 W which one of ordinary skill in the art would recognize as being able to be generated by applying power to an inductive coil (column 3 lines 3-5).

Dessaux et al. discloses all of the requirements of claims 6, 8, 12-13 and 15-16 except for a specific substrate temperature and gas flow rates. Dessaux et al. teaches

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that by varying treatment parameters such as pressure in the plasma (substrate temperature and flow rates of gases are treatment parameters and also would effect the pressure in the plasma) one can control the thickness or the ohmic value of the deposited metal film. Thus, the variables of gas flow rate and substrate temperature are dependant upon a desired result and are determined by routine experimentation.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Dessaux et al. to include substrate temperatures and gas flow rates in the claimed ranges by routine experimentation to achieve a desired metal layer thickness and ohmic value absent evidence showing a criticality for the claimed ranges.

Regarding claims 7 and 9, the pre-treatment gas pressure is 5 mbar for 5 minutes (column 4 lines 22-23).

Regarding claims 10, 11 and 14 the process gas is made up of a metal carbonyl precursor that deposits a layer containing the metals claimed (column 2 lines 21-25 and column 6 lines 45-48) and a gas/plasma of nitrogen and/or argon in examples 1 and 2.

Regarding claim 17, the process gas pressure of Dessaux et al. is 6-4 mbar with a plasma pressure of 0.2-50 mbar (examples 1 and 2).

Regarding claim 18, the deposition of Dessaux et al. comprises plasma-enhanced chemical vapor deposition (abstract).

Regarding claim 19, Dessaux et al. discloses the process as taking place in one processing system (column 2 lines 45-50).

With regard to claim 20, the limitations are met by Dessaux et al. in view of Ku et al. as discussed above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly Stouffer whose telephone number is (571) 272-2668. The examiner can normally be reached on Monday - Thursday 7:00-5:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kelly Stouffer
Examiner
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kms



TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER